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Evaluation of the UNICEF Level 3 response to the cholera epidemic in Yemen: crisis within a crisis

Executive summary**

Summary

In 2016–2017, the complex humanitarian crisis in Yemen, characterized by armed conflict, a critical food security and nutrition situation and the near collapse of health and water systems, gave rise to a massive outbreak of cholera/acute watery diarrhoea. This came in two waves: the first wave, starting in October 2016, was relatively limited, but the second wave, which began in late April 2017, spread throughout the country with alarming speed and reached catastrophic proportions, with some 1 million suspected cholera cases and at least 2,000 deaths.

The evaluation of the UNICEF response to the cholera/acute watery diarrhoea outbreak in Yemen is an evaluation of an emergency response within a wider humanitarian response. Many of the factors affecting the cholera response are common to the wider crisis as well; and the evaluation considers, inter alia, whether the cholera response had a positive or negative effect on that wider response.

The UNICEF response to the 2017 cholera epidemic in Yemen must be seen in the context of the wider system response to that epidemic, and more generally to the ongoing crisis in Yemen. The current armed conflict has had devastating consequences — security, economic and humanitarian — for ordinary Yemenis since 2015. By early 2017, there were and remain multiple competing demands on the humanitarian system.

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** The executive summary of the evaluation report is being circulated in all official languages of the United Nations. The full report is available in English from the UNICEF Evaluation Office website (see annex).

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The evaluation suggests that the overall response to the 2017 epidemic was slow in scaling up, unable to keep up with the scale and pace of the epidemic and probably had only a very limited impact on its overall course. That said, given the system-wide failure to anticipate the 2017 epidemic, for which UNICEF shares some responsibility, UNICEF responded relatively quickly once the scale of the epidemic became apparent, within the limits of its capacity and that of its partners. It adopted essentially the right approach, although this took time to emerge, and full operating capacity was not reached until the epidemic was already well advanced.

UNICEF is certainly now better placed to respond to a potential future epidemic, although it faces, together with its partners, a serious challenge in mounting the necessary prevention and preparedness measures. Short-term preventive measures including, crucially, an oral cholera vaccination campaign, are needed, together with work to strengthen surveillance and capacities at the community level and consolidate supply chains and partnership arrangements. Additional recommendations include taking urgent action on the supply of oral cholera vaccines, while also strengthening the regional capacity of UNICEF in epidemiological analysis; improving national and community-based surveillance; enhancing programme monitoring and quality control; and strengthening the organization's global preparedness and organizational learning on cholera.

I. Introduction and context

1. Yemen is in the grip of a multi-dimensional humanitarian crisis that is currently judged as among the most severe in the world.[1] Even before the armed conflict that broke out in 2015, Yemenis were suffering from relatively high levels of poverty, inadequate public services, a faltering economy and severe food insecurity — all of which were compounded by the political instability that followed the departure of the President during the Arab Spring of 2011. The current conflict has intensified the humanitarian situation to the point where famine has become a real possibility and fatal diseases, notably cholera and more recently diphtheria, have spread. The health system is near collapse and broken or inadequate water supply and sewage systems have undermined access to clean water and a safe environment. Meanwhile, 8.4 million Yemenis are dependent on food assistance, and severe acute malnutrition is affecting over 400,000 children.[2]

2. The 2016–2017 cholera outbreak in Yemen had two waves. While the first of these (from October 2016) was relatively limited in scale, the second (from late April 2017) was country-wide and of a different order of magnitude. In total, some 1 million suspected cases[3] of cholera/acute watery diarrhoea were reported in this second wave, although this figure is almost certainly inflated due to the poor application of case definitions and the inclusion of relatively mild diarrhoea cases. Although the proportion of actual cholera cases remains uncertain because of limited testing, this was by any measure a catastrophic outbreak — and one that spread with alarming speed across most of the country. In total, more than 2,000 people are reported to have died from the disease since April 2017. While the death toll and case fatality rate were less than might be expected for an epidemic of this scale, inclusion errors in the reported cases probably go a long way towards explaining this.

3. The UNICEF response to the 2017 cholera epidemic in Yemen must be seen in the context of the wider system response to that epidemic and more generally to the ongoing crisis in Yemen. By early 2017, there were and remain multiple competing demands on the humanitarian system, not least of which were the levels of food insecurity and malnutrition that were already critical and raising the risk of famine. The dramatic decline in public services, in particular health, water supply and waste treatment systems, had left the country highly exposed to potential epidemics and ill-equipped to respond effectively.

4. The present evaluation of the UNICEF response to the cholera/acute watery diarrhoea outbreak in Yemen is one of an emergency response within a wider humanitarian response. Many of the factors affecting the cholera response were common to the response to the wider crisis as well.

[1] "UN leaders appeal for immediate lifting of humanitarian blockade in Yemen – Millions of lives at imminent risk", joint statement by the Executive Directors of the World Health Organization, the World Food Programme (WFP) and UNICEF, 16 November 2017. Available from www.unicef.org/media/media_101496.html.

[2] WFP, "WFP Scales Up Response in Yemen to Prevent Famine", 2 April 2018, available from www.wfp.org/news/news-release/wfp-scales-response-yemen-prevent-famine.

[3] UN News, "Suspected cholera cases in Yemen surpass one million, reports UN health agency", 22 December 2017. Available from https://news.un.org/en/story/2017/12/640331-suspected-cholera-cases-yemen-surpass-one-million-reports-un-health-agency.

II. Evaluation scope, purpose and approach

A. Evaluation scope

5. The evaluation examines the following broad questions with regard to the UNICEF response to the 2017 outbreak:

(a) What preventive (risk-reduction) work was undertaken in advance of the 2017 outbreak and is now being undertaken to try to prevent or mitigate such an outbreak?

(b) How well-prepared was UNICEF to respond to the 2017 outbreak, especially in the wake of the smaller outbreak in late 2016?

(c) How quickly and effectively did UNICEF respond once the scale of the April 2017 outbreak became clear?

(d) How well placed is UNICEF now to respond to future outbreaks?

6. In each case, the evaluation reviewed the constraining factors involved (internal and external) and asked whether and how these have been addressed. Beyond the UNICEF response, the evaluation considers what role the organization played in coordinating, leading or facilitating the response of the wider system, through its cluster leadership and otherwise.

B. Evaluation purpose

7. The purpose of the current evaluation is three-fold:

(a) To inform the current and future UNICEF responses in Yemen by providing an evaluative analysis of the UNICEF response to the 2017 cholera/acute watery diarrhoea epidemic in the context of the Yemen conflict, the epidemiology of the 2017 outbreak and the wider system response to that outbreak;

(b) To provide a limited basis for accountability with respect to the 2017 UNICEF response: what UNICEF did, and when and where; whether the response was timely, appropriate and effective; and what were the key internal and external enabling and constraining factors;

(c) To add to wider institutional learning from UNICEF responses to cholera and other recent infectious disease outbreaks.

C. Evaluation approach and methodology

8. The present evaluation represents a new approach for UNICEF to humanitarian evaluations, under which the standard evaluation process is accelerated with a view to producing real-time results that can feed directly into programme decision-making. The primary methods used in the evaluation were key informant interviews, particularly with those directly involved in the cholera response; and documentary review, with a focus on planning, monitoring and decision-making. Findings from key informant interviews conducted outside of Yemen were triangulated with the results of partner interviews and focus group discussions with beneficiaries and local volunteers, conducted in country by the three Yemen-based consultants. Altogether, 95 interviewees were consulted for the evaluation.

III. Implementing the strategy: Key findings of the evaluation

A. UNICEF strategy and approach to cholera in Yemen

9. On 10 October 2016, four days after the declaration of the first cholera outbreak by the health authorities, UNICEF, with health and water, sanitation and hygiene (WASH) cluster partners, agreed on a three-month integrated cholera response plan and presented the plan to the humanitarian country team. The initial 2016 plan contained most of what is usually considered essential in cholera response and control, although it lacked specificity in some areas, including strengthening surveillance, achieving a quick response and tailoring the response to the local context.

10. The same basic strategy informed the response to the second-wave outbreak, although the design of the response evolved incrementally in three phases, reaching its final form at the beginning of July 2017. The initial phase of response (late April to mid-May) was very quick, thanks to existing capacity, although the outbreak was difficult to keep pace with, given the geographic spread of the epidemic and the exponential rate at which the number of cases was increasing. During the second phase of response (late May to late June) revised epidemiological projections were used to scale up and a revised response plan was developed that distinguished between: (a) "response/control" activities in affected areas to control the spread of the epidemic; and (b) an "immediate prevention" set of activities in high-risk areas that have not yet been affected. During the third phase of response (late June to early July), a revised approach was devised, based on the latest projections, to reduce transmissions by sharpening the targeting strategy to deliver rapid and targeted interventions in identified hotspots. During this third phase, the communication for development (C4D) campaign was substantially scaled up.

B. Cholera prevention and mitigation measures

11. Could the 2017 cholera epidemic have been prevented? Any answer is inevitably speculative, but given the operating environment and the deep-seated structural factors involved, it may not have been possible in the short term to substantially reduce the risk of a major epidemic. If the first wave had been completely contained, the chances of a major escalation would have been reduced. But the more fundamental preventive work required to prevent cholera, by ensuring adequate access to clean water and effective sewage treatment and waste disposal, is by its nature a medium- to long-term enterprise. This is particularly true given the very weak and damaged state of existing systems, taken together with the ongoing effects of conflict, insecurity, the lack of capacity and unstable governance. Even if it had been possible to mount a concerted effort to repair or sustain those systems following the late-2016 cholera outbreak, only limited impact could have been expected on the spread of water-borne disease by the time of the second-wave cholera outbreak in April 2017. That said, the role played by UNICEF in ensuring supplies of fuel, chlorine and spare parts to keep existing water and waste treatment systems operating was an essential one, without which the risk factors would have been even higher and the public health outcome probably worse.

12. Perhaps more pertinent than the question of prevention per se is whether the scale of any epidemic could have been reduced and its effects mitigated by shorter-term preventive interventions. Here the evaluation team found that more concerted preventive measures, including a preventive oral cholera vaccine campaign – could have gone at least some way to limiting the scope of the epidemic. A range of factors appears to have combined to prevent the proposed oral cholera vaccine campaign from proceeding after the 2016 outbreak. Those interviewed for the evaluation differed somewhat in their accounts of why it did not. In any case, with a lack of acceptance of the case for vaccination in some quarters, including some of the relevant health officials in Yemen, pressure for a campaign declined as the number of cases fell during

first wave, despite what appears in retrospect to have been a strong case for a preventive campaign. The question of an oral cholera vaccine campaign came back onto the agenda when the second wave began in late April 2017, and a request was made to the International Coordinating Group in Geneva. But the shortage of global supplies and competing demands meant that the International Coordinating Group could only provide only a limited number of vaccines. This in turn raised political questions about how the limited supplies would be allocated among different areas in Yemen. After some weeks, the proposed campaign was cancelled in July. By this time, the epidemic was already well advanced and the likely effectiveness of a reactive campaign was doubtful, since most areas had by then been affected.

13. Within the limited scope of the present evaluation, the evaluation team is not able to reach a firm conclusion on the prevention question. However, it is reasonable to conclude that more concerted preventive efforts, including a preventive oral cholera vaccine campaign in early 2017, might have significantly limited the scale of the subsequent epidemic.

14. As of the writing of this report, the same structural risk factors that existed in the period 2016–2017 are still in place, again, tackling these is a medium- to long-term endeavour. Other interventions have a greater prospect of having a preventive effect in the shorter term. The UNICEF supply of fuel, chlorine and spare parts remains essential, and steps should be taken to secure the related supply chains. Preventive work at the household and community levels, particularly communications aimed at changing hygiene and water-storage practices, is also important, although it cannot be assumed tnat behaviour change itself will happen overnight, depending as it does on effective social marketing.

C. Preparedness to respond

15. Those interviewed generally agreed that UNICEF was not well prepared to respond to the 2017 epidemic, nor was the response system as a whole. The reduction in cases during the tail end of the first wave evidently created a false sense of security and the belief that cholera in Yemen was under control. The possibility of an epidemic had been foreseen in the contingency planning exercises of 2016,[4] but not cholera specifically — and nothing on this scale. In short, UNICEF had not planned for this eventuality and, along with the rest of the humanitarian system, was taken by surprise when it occurred.

16. This is not to say that UNICEF was completely unprepared in April 2017. Its ongoing cholera response meant that it had a basis from which to scale up, albeit a limited one. Existing partnerships and programme agreements, long-term agreements with suppliers and operational protocols established during the response to the 2016 outbreak did help to provide a basis for responding to the 2017 epidemic. But the scale and nature of the 2017 outbreak was unanticipated, and the speed and geographical spread of the outbreak meant that the preparedness measures and existing arrangements that were in place were inadequate to the task. Several UNICEF staff members interviewed felt that, in retrospect, more should have been done to line up suppliers, pre-position stocks and prepare contingency programme cooperation agreements with partners.

17. Funding was not a significant constraint for UNICEF. Donors were generally supportive of the 2017 response and were one of the main sources of pressure to respond, providing flexible funds and interchangeability of funds between programmes. UNICEF and WHO both had substantial funding for system support from the World Bank, which in the case of UNICEF, allowed it to scale up its health, C4D and WASH work to address the 2017 epidemic.

[4] In the early warning/early action risk assessment process.

18. In contrast, partner capacity was a major constraint on the scale and pace of the UNICEF response. Few of the international non-governmental organization (INGO) partners that UNICEF traditionally works with were present to bring the capacity to deliver on a large scale. This was in part due to the constraints of the operating environment and the difficulties of getting visas for international staff.

19. Opinions vary as to how well prepared UNICEF is now to respond to a potential third wave or new epidemic. Some of those consulted were relatively confident in this regard, while some felt that UNICEF and others would again be caught off guard if the circumstances of 2017 were to be repeated – not least because of response-capacity deficits.[5] The evaluation team found that UNICEF was certainly better prepared now than in 2017, but that considerable challenges remained.

20. Although there are practical limits to how far preparation can be made for any given contingency, albeit one with such a high level of risk and potential harm, UNICEF is certainly better prepared now to respond than it was in 2017, not least because of the lessons learned from that experience. Preparedness measures in place include multiple contingency programme cooperation agreements, operational plans with local authorities and increased stockpiling at strategic locations together with the integrated cholera plan. Partnerships are now well established, including the rapid response team model with the authorities, although delivery capacity remains uncertain.

D. The UNICEF response to the 2017 epidemic

Coverage and proportionality

21. UNICEF dramatically scaled up its response ambition between May and July 2017, as the full scale of the epidemic became apparent. This is evidenced by the increase in integrated cholera response plan targets. For example, the targeted number of functional diarrhoea treatment centres (DTCs) increased three-fold, from 25 to 75; the targeted number of people benefiting from household-level water treatment and disinfection increased from 500,000 to 12 million; and the targeted number of people reached with cholera key behaviour change practice messages increased from 2 million to 12 million.[6]

22. This scale-up put an enormous strain on UNICEF Yemen at a time when it was already in full Level 3 emergency response mode, particularly in dealing with the nutrition crisis. It also ran up against the limits of available partner capacity. However, the evaluation team believes that UNICEF was right to scale up to this extent across all three sectors (health, WASH and C4D/community mobilization). No other organization was capable of doing so, and by scaling up to this extent, the UNICEF response became at least proportionate to (if not quite commensurate with) the scale of the epidemic.

Timeliness

23. Following the escalation in the number of reported cases in late April/early May 2017, it took time for UNICEF Yemen to adjust, recognize the scale of the challenge and ask for the help it needed from the wider organization. Apart from a lack of preparedness, some other country-level factors had an impact on the speed of the UNICEF response. One of these was a lack of clarity with WHO over the role of UNICEF in the health response, and specifically the establishment and running of the DTCs.

[5] As documented in UNICEF interview (i13).

[6] Targets of the initial plan were developed in early May 2017. Revised targets of the new plan were finalized as at 4 July 2017.

24. In any process of rapid programme expansion, particularly on this scale and in such a challenging operating environment, there is some inevitable lag (e.g., security, supply, human resources, finance and partner contracts). However, some of the other delays in the response were not inevitable and should have been avoided. The delivery of some elements of the programme, notably the C4D component, lagged behind other elements and was not always well coordinated with them. The fact that the household sensitization campaign was not mounted until August, after the epidemic had peaked, is the most striking example of this. The lack of pre-existing partnerships in many of the affected areas was also a significant constraint: new partners had to be identified and volunteers trained and deployed against a backdrop of limited access.

25. There was a perception among some actors that the WASH component of the response, in particular, was slow to be delivered. In an interview for the evaluation, the Yemen Humanitarian Coordinator commented that by July 2017, the health and WASH sectors were struggling to deal with the epidemic, leading him to call for a system-wide response by mobilizing partners from across all sectors.[7] His perception was that rural areas, especially, were being underserved.

Coherence

26. Although the three main components of the response — health, WASH and C4D — were planned together, they were not always harmonized in practice. As one head of a UNICEF field office noted, "sometimes two components were implemented together, but generally not three".[8] Nutrition was at first not coordinated with the other components, although this changed over time. Better harmonized responses, both within the UNICEF programme and across the response system, have the potential to improve control effectiveness. More harmonized planning between the health and WASH rapid response teams would also help to achieve better results.

Effectiveness

27. In terms of the achievement of reach in the delivery of services to affected or at-risk populations, the performance of UNICEF has generally been impressive, particularly given the programme's scaled-up ambitions. As of November 2017, progress against cholera targets in Yemen included the following: 64 of the targeted DTCs were made functional (85 per cent of the 75 targeted); 632 oral rehydration corners were made functional (79 per cent of the 800 targeted); 5.7 million people living in areas at high-risk for cholera gained access to safe drinking water (96 per cent of the 6 million targeted); 9.2 million people in cholera high-risk areas benefitted from household-level water treatment and disinfection (77 per cent of the 12 million targeted); 85 per cent of DTCs received WASH services (out of 100 per cent targeted); 17.8 million affected people were reached through interpersonal community engagement efforts promoting four practices for cholera prevention (exceeding the target of 17.5 million); and nearly 39,000 social mobilizers were deployed for key behaviour changing in cholera high-risk areas (97 per cent of the 40,000 targeted).[9]

28. The biggest shortfall was for household WASH interventions, suggesting an over-ambitious target in this area and reflecting the lack of partner implementation capacity. The scale of achievement is nevertheless impressive, although it raises questions about how interventions were prioritized within the overall response. Informant interviews suggest that the shortfall was mainly in rural areas. The same question arises for the DTC and oral rehydration shortfalls.

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[7] Interview (i20). This call was issued on 3 July 2017.

[8] Interview (i16).

[9] UNICEF, "Yemen Humanitarian Situation Report", November 2017. Available from www.unicef.org/appeals/files/UNICEF_Yemen_Humanitarian_Sitrep_November_2017.pdf.

29. How effective these interventions were in helping to control the epidemic and reduce mortality and morbidity is less clear. A number of factors affected this. As noted above, one is the timing of the interventions relative to the spread of the epidemic. Given the time taken to roll out the WASH programme, it is doubtful whether it had a substantial control effect on the overall course of the epidemic, though it likely provided important protection to households against cholera and other water-borne diseases.

30. A second factor affecting outcomes is the quality of the interventions – for example, the quality of case identification and management together with infection prevention and control in the DTCs, which seems to have had an impact on health outcomes. The low case fatality rates suggest that treatment in the DTCs was generally successful, although the uncertainty of the data means that this must be interpreted with caution. The apparent failure to provide all DTCs with WASH services (a 15 per cent gap) raises questions about infection prevention and control in those centres.[10]

31. The scope of the C4D work – 18 million Yemenis reached with behaviour change messages – is impressive, but its effects are largely unknown. The spike in admissions to treatment centres appears to indicate some success in terms of health-seeking behaviour. However, several interviewees for the evaluation raised questions about the effectiveness of an approach that was based on the largely untested assumption that a few minutes spent delivering messages would result in people changing their normal behaviours.[11]

32. With regard to WASH, following the logic of the control strategy of UNICEF, a strong case can be made that by addressing the main known risk factors for water-borne disease, the organization's WASH interventions substantially reduced levels of risk and vulnerability in the areas in which they were implemented. On the other hand, apart from timing and coverage issues and the poor quality of the available data, it must be said that what was known was based on general principles rather than on investigation of the context-specific risk factors, behaviours and transmission contexts. A more informed response would have allowed better targeting and potentially a greater control effect.

33. The wider effects of UNICEF interventions are even harder to determine. The ambition was not simply to respond to cholera, but to help strengthen systems, including the health and surveillance systems. There is good reason to think that UNICEF, together with WHO and other actors, was successful in preventing the further decline of systems. The impact of a range of practical interventions, from the provision of fuel for pumps to the payment of incentives for health workers whose salaries had not been paid, suggests that the decline of public services would have been significantly more damaging without those interventions. More time is needed, however, to judge how sustainable those gains will prove in a highly unstable environment.

Quality of interventions

34. This is an area in which UNICEF acknowledges that it had difficulties. Interviewees suggested that there was a trade-off between expanded coverage and the quality of the programme.[12] A lack of sufficient oversight of partner programmes exacerbated this. The third-party monitor reports raise concerns about the quality of service in the DTCs.

35. Quality depends upon a range of factors, in particular the clarity of protocols and expected standards together with relevant training and good management and

[10] It is possible that others made up the deficit, but this is not indicated in the reports.

[11] As documented in interviews (i13), (i15).

[12] UNICEF interviews (i17), (i31); external interview (i30).

oversight, with related accountability for performance. In the Yemen context, there was inter-agency agreement on protocols and standard operating procedures for DTCs (although these took time to be produced); but the training, oversight of partners and accountability elements were evidently weak or missing. This is clearly an area that UNICEF needs to strengthen in any future cholera response.

E. Programme monitoring and quality control

36. Programme monitoring and quality assurance is often difficult when operating in very insecure and fast-changing environments. The combination of a massively scaled-up programme, ambitious delivery targets and a lack of adequate partner capacity to deliver meant that UNICEF was challenged to ensure adequate programme oversight. Its field officers worked hard in this respect, as did the planning, monitoring and evaluation team, and their coverage is testimony to their endeavour.[13] But with limited staff numbers[14] due to access challenges, they were inevitably limited in their coverage. Good use was made of third-party monitoring, but while effective at picking up issues retrospectively, this is not a substitute for programme oversight. Despite the integrated nature of the programme, joint field monitoring (i.e., for WASH, health and C4D) was rarely achieved, although the use of jointly compiled checklists helped to ensure that all sectors were covered.[15]

37. Perhaps the bigger issues concern the effective use of the compiled data. This was not something that the evaluation team was able to analyse in any detail, but the issue was raised by several interviewees and evidently needs further attention. The challenges in feeding monitoring data into programme decision-making is an area noted for improvement.

F. The efficiency of the cholera response: Internal and external factors

Partnerships, collaboration and coordination

38. As noted earlier, the availability of adequate delivery partnerships was one of the main limiting factors on the UNICEF response to the 2017 epidemic. The lack of INGOs with WASH capacity was in particular a major constraint, although this improved to some extent following an international call for additional support in July 2017.[16] Under the circumstances, the operational partnerships formed with the public water authorities and the health authorities were strong and effective, particularly with regard to the rapid response teams and the deployment of community health volunteers. Interviewees suggested that C4D partnerships could have been more efficient, although the evaluation team was unable to investigate this.

39. Relations with donors appeared to be strong, as reflected in donors' flexibility in the re-allocation of funds towards cholera response priorities. Partners interviewed in the field noted a similar flexibility on the part of UNICEF, although funds were sometimes slow to be dispersed to them. A lack of sufficient support and oversight of partner programme delivery (e.g., in establishing and supporting DTCs) had implications for programme quality. This is perhaps the most important area for improvement for UNICEF and other actors, including building the delivery capacity of local partners.

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[13] Some 16 humanitarian programme monitors were deployed, as were additional monitors specifically for the cholera programme. Interview (i16).

[14] The planning, monitoring and evaluation team had four international and four national staff members (i16).

[15] Interview (i24).

[16] Some traditional UNICEF partners in this field, such as Oxfam, were able to operate only on a limited scale.

40. UNICEF collaboration with some government partners was at times challenging, in part because of the political situation, gaps in effective governance and the severe under-resourcing of the relevant ministries. Working with the health system was essential to achieving scale, particularly with the lack of capacity of some more-traditional international partners. It was also said to be important for sustainability and for building system capacity.[17] The evaluation team agrees with this assessment and found that the collaboration with government entities, for all the complications, was both appropriate and largely effective. The rapid response teams provided the most positive example of this.

41. The quality of collaboration with WHO was much more mixed. Relations were reported to have involved frequent technical negotiations on issues that should have been resolved more quickly. There appears to have been a gap between agreements made by the two organizations at the global level and the local realities on the ground.

42. Although the scope of the evaluation did not include a full review of the relevant coordination mechanisms, based on what was reported to the team in interviews with, mainly, UNICEF staff, overall coordination appears to have had multiple overlapping mechanisms. In particular, the respective roles of the clusters (health/WASH) vis-à-vis the emergency operations centres were poorly defined. The emergency operations centre model was not rolled out across the country as planned, and appears not to have worked well.

UNICEF management and support functions

43. Although management issues have not been a specific focus of this evaluation, the evaluation team found that the overall management of the UNICEF response appeared relatively strong, with good leadership at both the country and regional levels. Nothing reported by key informants contradicted this view. Although, as noted above, UNICEF as a whole was slower than it could have been in scaling up its response, it was relatively swift in its reactions compared with other organizations and took a leading role in the subsequent response. The Level 3 simplified standard operating procedures, particularly the emergency programme cooperation agreement procedures, appear to have helped in this respect. Surge mechanisms proved essential, although the limited availability of staff (internal and external) experienced in cholera response was a significant hindrance.

44. Senior staff in Yemen acknowledged that the cholera response had some indirect effects on the rest of the programme, particularly nutrition and internally displaced persons responses, at least in terms of management attention. Nutrition services continued, achieving approximately 70 per cent of the target, though a number of factors were said to have contributed to that shortfall. The wider indirect effects on the organization are hard to quantify, but as noted by one interviewee from the UNICEF Office of Emergency Programmes,[18] at the time of the response, UNICEF was dealing with several Level 3 emergency situations.[19] As a result, resources available for support and oversight are overstretched, with many key staff members already committed and unavailable for redeployment on short notice.

IV. Conclusions

45. It is hard to escape the conclusion that the system-wide response to the 2017 epidemic was too slow to scale up, was unable to keep up with the scale and pace of the epidemic and had only very limited impact on its course. Once the 2017 epidemic

[17] Interview (i25).

[18] Interview (i36).

[19] This issue, along with the standard operating procedures for Level 2 and Level 3 emergencies, is reported to be under review both within UNICEF and as part of an inter-agency process.

escalated in May 2017, it was evidently beyond the ability of the existing response system to control.

46. This must be qualified by acknowledging the exceptionally challenging context. There were multiple competing demands on the humanitarian system, not least the food security and nutrition situation, which was already critical and which threatened to precipitate famine. The dramatic decline in public services since 2015, in particular the health and water supply/sewage treatment systems, had left the country highly exposed to potential epidemics and ill-equipped to respond effectively. Millions of Yemenis are exposed to water-borne disease and are highly vulnerable to the effects. Controlling a cholera epidemic is very challenging, even in more favourable operating conditions. In Yemen, a lack of system capacity (local, national and international) and preparedness to respond, coupled with extremely difficult operating conditions, meant that in the period after May 2017, the response was not able to control the spread of the disease.

47. This was an epidemic that might, in theory at least, have been prevented from occurring, or at least significantly mitigated. In practice, given the current state of water supply and waste disposal infrastructure and the very high levels of political instability, the necessary system-level preventive work could take years to achieve. Mitigation is a more reasonable expectation. But the outbreak that started in October 2016 had not been brought under control and no preventive vaccination campaign had been mounted. When the second wave of the outbreak began, in late April 2017, more concerted and timely control measures could probably have limited its spread. Yet the humanitarian system was taken by surprise and hence unprepared to respond to an epidemic of this magnitude. This systemic lack of anticipation and preparation for a major epidemic must be counted as a significant failing, even allowing for the multiple challenges and the practical limits to preparedness.

48. The general conclusions outlined above for the overall response are necessarily tentative. Within the scope and limits of the evaluation, the evaluation team is unable to be more definite. But given the prospect of a further outbreak in 2018, the conclusions prompt urgent questions for the system as a whole. Have all reasonable steps now been taken to prevent a further outbreak? Is the system, and are communities themselves, now better prepared to respond to such an outbreak? How confident are we that the response would be more timely, joined-up and effective than in 2017? Are we as confident as we can be (given the volatility of the context) that the system and local communities now have the capacity and tools to effectively identify, control and contain such an outbreak through early interventions?

49. The overall conclusion on the performance of UNICEF is that given the failure to anticipate the 2017 epidemic — for which UNICEF must take at least a share of responsibility — it responded relatively quickly once the scale of the epidemic became apparent, within the limits of its capacity and that of its partners. It adopted essentially the right approach, although this took time to emerge, and full operating capacity was not reached until the epidemic was already well advanced. Working relations with WHO were not as strong as they should have been, and it took time to resolve differences over roles and priorities. Indeed, some of the differences appear to remain unresolved. UNICEF worked well with government authorities and the relevant ministries, and did well on leading and mobilizing others around essential cholera-related WASH efforts, although less so on community engagement. Given the major gaps in overall response capacity, it rightly decided to go beyond its anticipated sphere of operation in the scale of its health interventions. The WASH cluster was well led and appeared to coordinate effectively with the health cluster, even at a time when overall coordination of the response was confused.

50. Like other actors, UNICEF found itself chasing the epidemic, but it was among those leading the chase and urging further collective action. In striving for maximum coverage, UNICEF struggled to ensure the quality of its interventions through

partners (notably in setting up and running DTCs), though it was not alone in this. The effectiveness of some UNICEF interventions, particularly its community engagement and sensitization work, remains uncertain, partly because monitoring was limited. But UNICEF staff, partners and volunteers deserve considerable credit for achieving what they did under exceptionally difficult operating conditions. Their extreme hard work and dedication saved many lives and protected many more.

V. Recommendations

51. **Recommendation 1: Secure vaccination supply for further vaccination campaigns.** Given the very high risk of another cholera outbreak, the vulnerability of the population and the limits to humanitarian response, the case for a preventive oral vaccination campaign in early 2018 is compelling. While working on a political agreement with the relevant authorities in Yemen, it is recommended that on a no-regrets basis an urgent request to suppliers be placed through the International Coordinating Group to allow for a targeted campaign in the highest-risk areas.

52. **Recommendation 2: Establish regional specialist capacity for epidemiology/cholera.** The evaluation team believes that in-house epidemiological capacity is an essential component of the UNICEF armoury against cholera and other epidemic diseases. Reliance on internal surge capacity to fulfil this role proved too slow in Yemen in **2017**. The vulnerability of countries in the Middle East and North Africa (MENA) region is such as to justify a dedicated specialist post in the MENA Regional Office and should be seen as part of a regional capacitation approach. This would enable the Regional Office to work with country offices to, for example, help to conduct risk assessments and draw up contingency plans; routinely assess countries' preparedness capacities; analyse emerging data on cholera or other epidemics; and support cross-country lesson learning.

53. **Recommendation 3: Build regional response capacity for cholera.** UNICEF should build regional response capacity in the MENA region by constituting a network of cholera-experienced staff, conducting regional trainings to share the latest knowledge and global know-how from other regions and sharing cholera experience in other countries. Countries should be supported to prepare guidelines, response plans, standard operating procedures and training packages so as to be ready to respond.

54. **Recommendation 4: Establish a cholera task force at the regional office level.** There is a lack of coherence both in the advisory input on cholera from different UNICEF sections and between the different components of the UNICEF programme. With regard to advisory input, it is recommended that the different sections in the MENA regional office with responsibility in this area (WASH, health, C4D and nutrition) constitute themselves as a cholera task force for the duration of the epidemic to facilitate more coherent planning, support and programme implementation.

55. **Recommendation 5: Harmonize UNICEF / WHO approaches and clarify roles.** During the cholera response, different understandings of roles between UNICEF and WHO took time to resolve. A central component of preparedness for a further epidemic or third wave should therefore be management discussion between UNICEF and WHO about the lessons from 2017 and how to ensure that the two agencies better harmonize future responses.

56. **Recommendation 6: Clarify coordination processes.** Coordination of the 2017 response in Yemen was confused, with multiple mechanisms overlapping and running in parallel. In particular, the respective roles of the clusters (health/WASH) vis-à-vis the emergency operations centres were poorly defined. Another essential component of preparedness is the clarification and simplification of the cholera-related coordination processes and the respective roles of the Cholera Task Force, the emergency operations centres, the health/WASH clusters, the Office for the

Coordination of Humanitarian Affairs and the Humanitarian Country Team/Inter-Cluster Coordination Mechanism.

57. **Recommendation 7: Scale up and secure preventive WASH work.** While much of the essential preventive WASH agenda is medium to longer term, some components are crucial to prevention in the shorter term. This includes system maintenance and the ongoing supply of fuel, chlorine and spare parts for water supply and waste treatment systems. Given the volatility of the situation in Yemen, UNICEF should take all necessary steps to secure the relevant supply chains and create contingency stockpiles as appropriate, while also conducting C4D and protecting water sources in high-risk areas and at the local level.

58. **Recommendation 8: Strengthen Yemen national cholera surveillance and reporting.** Despite progress on the local-central surveillance process and the introduction of electronic line listing, more needs to be done to strengthen this process to improve data accuracy and the speed of reporting. It is recommended that UNICEF work with WHO and the health authorities to undertake an audit of the local-to-national surveillance system, with a view to identifying necessary steps to strengthen the system.

59. **Recommendation 9: Strengthen community-based surveillance and response capacities.** Given the security and access challenges, UNICEF and its partners should help to strengthen community capacities in high-risk areas to prevent, prepare for and respond to outbreaks of acute diarrhoea. This would require both enabling the identification and notification of cases through community focal points and early treatment of suspected cases through community-level oral rehydration points.

60. **Recommendation 10: Enhance rapid response capacities.** UNICEF should build on the rapid response team and Rapid Response Mechanism models and, with its partners, take stock of lessons learned from 2017 to strengthen these mechanisms for future responses. This would include revising rapid response team standard operating procedures and training modules, conducting trainings ahead of further outbreaks and supporting joint inter-agency planning, including the precise definition of roles and responsibilities and the running of simulation exercises. Appropriate pre-agreements and contracts should be put in place with operational partners and suppliers.

61. **Recommendation 11: Establish additional response preparedness measures.** In addition to the preparedness-related measures noted above, UNICEF should take further action to: ensure WASH response capacities, including through training; ensure the necessary supply for cholera kits; and invest in contingency stocks or purchase arrangements at the local and international levels.

62. **Recommendation 12: Strengthen monitoring and quality control.** UNICEF monitoring and programme follow-up in 2017 faced the challenge of covering a massively scaled-up programme with relatively limited resources and difficult access. This is of concern from the perspective of both accountability and quality control, and is a problem for the system as a whole. UNICEF should do all it can to strengthen both direct and indirect monitoring. An essential corollary to this is that UNICEF finds ways to better utilize the results from programme monitoring to continuously inform the ongoing response and adapt it accordingly.

63. **Recommendation 13: Invest in better understanding of behaviours and transmission contexts.** The 2017 response was not adequately informed about household and community practices, or about people's knowledge, attitudes and beliefs concerning cholera and the response to it. A knowledge, attitude and practice survey is currently planned, and should be supplemented by ongoing efforts to understand household perceptions and challenges during the course of any outbreak response. UNICEF should also invest in epidemiological and socio-anthropological research, identifying cholera hotspots, risk factors and community risk behaviours and practices as well as community uptake of campaign messages.

64. **Recommendation 14: Consolidate UNICEF global learning on cholera.** UNICEF has learned a great deal from the experience of responding to the 2017 cholera epidemic in Yemen; other recent major cholera epidemics in Haiti, South Sudan and Zimbabwe; the cholera regional initiatives in West Africa and Eastern and Southern Africa; and other forms of epidemic response (notably for Ebola). UNICEF should hold an internal learning event that brings relevant staff together to consolidate recent experience on cholera, using Yemen as a key case study.

65. **Recommendation 15: Consolidate UNICEF global epidemiological capacity.** Given the Yemen experience, UNICEF should establish a network of global and regional cholera experts (internal/external), who would be part of the global exchanges and capitalization efforts. Members of this network might provide additional surge capacity during major outbreaks and play an oversight and monitoring role at the regional and global levels. Related to this, UNICEF should play a greater role in building global epidemiological understanding.

66. **Recommendation 16: Strengthen UNICEF global cholera preparedness.** UNICEF should review its preparedness to respond to cholera outbreaks in all high-risk regions and countries. Risk assessments and contingency plans should be built into country plans as appropriate. This should be done in collaboration with WHO and other relevant partners, with a view to ensuring close coordination and collaboration with other international organizations.

Annex

Evaluation of the UNICEF Level 3 response to the cholera epidemic in Yemen: crisis within a crisis

Due to space limitations, the text of the independent report entitled "Evaluation of the UNICEF Level 3 response to the cholera epidemic in Yemen: crisis within a crisis" is not contained in the present annex. The report is available from the UNICEF Evaluation Office website:

www.unicef.org/evaldatabase/index_102910.html.